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Influence Breast Cancer Patient Treatment Choice?


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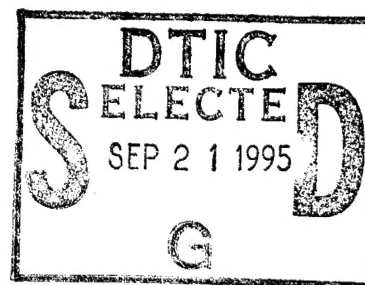

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**13. ABSTRACT (Maximum 100 words)**
Patients with metastatic breast cancer frequently undergo aggressive therapies that have an uncertain quality-adjusted survival advantage. Framing theory suggests that individuals may not maximize their expected utility if presented with treatment options described in a negative manner, as opposed to the same information described in a positive manner We developed an instrument to assess information framing and tested it in a pilot survey of oncologists who offer stem-cell transplant therapy to their patients. The framing instrument was evaluated by assessing agreement between coders. Analysis of pilot data included descriptive statistics, logistic and log-linear regression of the recommendation of aggressive treatment across three scenarios and the use of content and context in treatment recommendation on physician characteristics and practice patterns. In univariate analysis, physicians who recommended stem cell transplantation in all three cases were likely to do so to improve survival (p<0.001) and those who did not recommend stem cell transplantation in all cases were more likely to recommend an alternative treatment to improve quality of life (p<0.02). Preliminary analysis indicates that physician characteristics, practice characteristics and scenario treatment recommendations are related to the phrasing of treatment options for patients with metastatic breast cancer.

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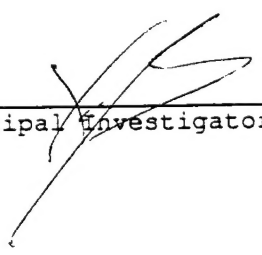( ) Where copyrighted material is quoted, permission has been obtained to use such material.

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## INTRODUCTION

Patients with metastatic breast cancer frequently elect to receive high-risk, uncomfortable treatments the potential benefits of which are uncertain. Physicians have reported that they would not make similar treatment decisions for themselves (1,2). In the following sections, we review the medical literature addressing patient-physician communication and the communication about risk to address these unexpected treatment decisions. We will also discuss the development of the information framing measure that was the objective of the year one phase of the study, preliminary analysis of pilot data and the objectives for year two of the study.

### Background

Physician-patient communication is the foundation for a shared clinical decision making process and is crucial for the maximization of patient utility from treatment for disease. Yet, patients and physicians have reported differences in their interpretation of their roles in the decision-making process (3) and their expectation of treatment benefits (4-6). In a survey of cancer patient expectations, 33 percent of patients being treated palliatively indicated that they thought their treatment was potentially curative (4). Patient overestimation of treatment benefit has also been documented in a study involving independent observers of the patient-physician interviews (5).

The field of cognitive psychology may provide insights into systematic patient overestimation of treatment benefit and choice of risky treatment. In communication about risky options, the manner in which the information is presented or framed can affect an individual's preferences for identical outcomes (7,8). When presented with information framed negatively, such as in terms of death or disease, the majority of subjects chose an outcome described by uncertainty (a risk of benefit and a risk of no benefit). When

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presented with information framed positively, such as in terms of life saved, the majority of the same individuals chose an outcome described by certainty (7,8).

Similar effects have been found with an evaluation of patient preference for drug therapy given potential side effects with uncertain outcomes. With a positive frame, the certain option was chosen 67% of the time. With a negative frame, however, treatment preferences reversed, and almost 60% of the participants preferred the uncertain outcome (9). Descriptive frames using the words survival or mortality, have been shown to influence preferences for lung cancer treatments (10).

Framing effects have been difficult to assess in actual clinical practice (11,12) since observational studies cannot control for variability in patient age, patient co-morbidities, and the inherent risk preferences of individual patients and physicians. Physician preferences for cancer treatment have been demonstrated to differ based on physician specialty (13-15), attitudes about patient involvement in the decision making process (14-16) and by patient age (15). The large sample sizes required to evaluate each of these potential patient and physician covariates necessitate the development of a more innovative method for the evaluation of information framing in clinical practice.

## Significance

We have developed an innovative measure of information framing for use with simulated metastatic breast cancer patients. In the body of the report, we describe the pilot data used to develop the information framing instrument, the evaluation and tests of reliability for the instrument, and the use of case scenarios to elicit treatment recommendations from physicians. Finally we describe the preliminary analysis of the pilot data using the framing instrument and implications for remaining work to be completed in year 2 in relation to our primary hypotheses: 1) physicians are more likely to use a negative frame when recommending aggressive treatment to metastatic breast cancer

patients and 2) the use of framing is specific to a patient's age and clinical context but is not specific to disease stage.

The results of this research will be disseminated to physicians to help them understand the role of information framing in patient decision making, and can be used to stimulate further research in physician-patient communication. The goal of this research is to help patients and their families achieve the maximum benefit from their treatment decisions in the management of breast cancer treatment.

In the following sections, we describe the work completed in year one. We have developed an information framing instrument, evaluated and tested its reliability, and tested the use of case scenarios to elicit treatment recommendations from physicians. We have performed a preliminary analysis of the pilot data using the framing instrument to document differences in physician description of treatment options based on physician characteristics, patient characteristics, and treatment recommendations.

## DEVELOPMENT OF FRAMING INSTRUMENT

Pilot Data Development

In order to develop an instrument to assess the use of framing by physicians in their conversations with cancer patients, we developed pilot data using audiotapes of physician consultations with cancer patients and physician responses to a mailed survey regarding the phrasing of treatment recommendations to cancer patients. We audiotaped approximately twenty initial consults between physicians and their patients and partially transcribed their conversations. All information content areas were noted across the tapes, and the tapes were re-evaluated for variation in delivery of information across patients.

A pilot survey was then developed to assess the description of treatment options by physicians in response to patient case scenarios. Physicians were requested to complete a four section survey. The first section requested physician demographic information. The second section requested information related to practice and practice style, such as the number of times the physician would speak with the patient prior to recommending a treatment. The third section was composed of three case scenarios of women with metastatic breast cancer which varied by the age and level of co-morbidities of the women . For each scenario, the physician was requested to recommend one of three adjuvant treatment options: conventional dose chemotherapy; conventional dose chemotherapy followed by high dose chemotherapy and peripheral blood progenitor cell or autologous

bone marrow support; or an intermediate dose of chemotherapy requiring growth factor support, but not requiring the infusion of peripheral blood progenitor cells or autologous bone marrow; and provide a primary reason for this treatment recommendation. The final section of the survey requested the physician to phrase the treatment recommendation to the hypothetical patients in a style close to actual conversational style.

The survey was distributed by mail to 155 oncologists affiliated with a private stem-cell transplant network. The survey was completed by 93 oncologists for a final response rate of 63%.

Instrument development

Content analysis, a process which divides a conversation into its smallest meaningful pieces (17), was used to evaluate both the content and context, or frame, of the information contained in the free-form description of treatment options. This analysis requires an specialized instrument in which to capture information content in a uniform fashion. Since content analysis had not been utilized previously to evaluate the use of information framing in describing cancer treatment options, a draft instrument containing preliminary content categories was developed from the audiotape data described previously. These content categories were further defined by coding a small sample of cases from a pilot survey of physicians treating cancer patients with stem cell transplantation. For ease of coding, the coding worksheets were divided into four sections for each content category -- a general discussion section unrelated to treatment recommendation, and three sections devoted to each of three potential treatment options. Each section was sub-divided into a positive (in support of the treatment option), negative (against the treatment option) or neutral (mentioned, but neither positive nor negative) context with which to indicate the "frame" of each statement. A copy of the coding worksheet is attached in Appendix Table 1.

Based on the review of tape-recorded physician-patient interactions and preliminary coding, seventeen content categories were developed. These content categories included the mention of the type of previous therapy; future therapy; future benefits; reference to tumor growth or metastases; specific reference to cancer, nodes, or disease; response to therapy; side effects of treatment; survival or long-term cure; quality of life; other aspects of life; remission or recurrence; physician experience or clinical trial evidence; physician preference for treatment; specific mention of risk or chance; general uncertainty; general effects of treatment; and other symptoms of disease. The instrument was then tested for usefulness and reliability using the mailed survey.

In this exercise, two coders were blinded to the case, the physician's treatment recommendation, the reason for treatment recommendation, and the physician subject number. After each coder completed all available cases, the four sections of the coding worksheet were collapsed into summary counts of positive, negative or neutral statements by content category for each physician case. The category "other aspects of treatment" was eliminated since neither coder reported a single statement in any of the cases. Due to low frequencies and similarity of content category, the categories "future benefits" and "future treatment" and "other aspects of life" and "quality of life" were combined.

Dummy variables were created for each content category and the "frame" of the statements for each of the three case scenarios. Correspondence between the two coders was evaluated by comparing their responses by content categories, by "frame" of statement, and by content category and frame for each free-form physician recommendation. Agreement was calculated for each coder pair.

From the 93 survey respondents, 219 free-form scenario recommendations were analyzable by both coders. Correspondence between the two coders was evaluated across content categories and the context of the statements or statement "frames" by case. Agreement between the two coders was well over 90% for each of the 123 combinations of

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case, content and context (see Appendix Table 2). Because of the lack of variability in this binary data, kappa statistics are not reported.

## ANALYSIS OF PILOT SURVEY DATA USING FRAMING INSTRUMENT

### Data Source

The survey was distributed by mail to 155 oncologists affiliated with a private stem-cell transplant network. The survey was completed by 93 oncologists for a final response rate of 63%.

### Methods

Descriptive demographic statistics were performed for respondents and non-respondents where this information was available.

Univariate and multivariate log-linear regressions were performed to evaluate the relation between physician and practice characteristics, and the physician recommendation of aggressive treatment (conventional dose chemotherapy followed by high dose chemotherapy and peripheral blood progenitor cell or autologous bone marrow support) across the three cases.

Preliminary logistic univariate and multivariate analyses were performed on the following content categories: specific mention of the words risk, chance or likelihood, physician preference for treatment, mention of survival, remission or recurrence, mention of cancer, node or disease, and general uncertainty to evaluate the relation between physician characteristics, practice characteristics, treatment recommendations and the phrasing of recommendations. The categories remission/recurrence and general uncertainty were not related to any of the explanatory variables and were eliminated from further analysis.

Results

The vast majority of physicians responding to the survey were white males. 45.2%
of physicians had between one and five patients new transplant patients a year, 23.8% had
between six and ten new patients, 20.2% had between eleven and twenty new patients and
10.7% had greater than twenty-one new transplant patients. Where available, these
demographics and practice characteristics were similar between physicians responding to
the survey and the non-respondents (see Appendix Table 3).

The respondents were almost evenly split between general oncology and a mixed
practice of general oncology and stem-cell transplant. None of the subjects practiced in
groups performing only stem cell transplantations. On average, physicians reported that
they saw a typical patient prior to recommending treatment 2.34 times. In response to the
first scenario case, 97% of physicians recommended stem cell transplantation, and the
remainder recommended standard dose chemotherapy. In case two, 50% recommended
stem cell transplantation, 11 % recommended intermediate dose chemotherapy and 38 %
recommended standard dose chemotherapy. In case three, 30 % of physicians
recommended stem cell transplantation, 10 % intermediate dose chemotherapy and 59%
recommended standard dose chemotherapy.

When providing a reason for their treatment recommendation, physicians could
report more than one reason, so these percentages do not add to 100. In the first case, 95%
recommended treatment to maximize survival, and 18% recommended treatment to
maximize quality of life. In case three, these percentages almost reversed -- 87%
recommended treatment to maximize quality of life and 34% recommended treatment to
maximize survival. In case two, the reason for treatment recommendation was in the mid-
sixties for both maximizing quality of life and survival (see Appendix Table 4). These
written case scenarios elicited very different responses in treatment recommendation and the
goals of treatment from the physicians surveyed.

In univariate log-linear analysis, physicians who recommended stem cell transplantation across the three cases were likely to do so to improve survival ($p<0.0003$) and physicians who did not recommend stem cell transplantation were more likely to recommend an alternative treatment to improve quality of life ($p<0.0484$) Age, gender, race, the number of new bone marrow/stem cell transplant patients a year, and the number of times a physician would see a patient prior to making a recommendation were unrelated to the recommendation of aggressive treatment (see Appendix Table 5).

In multivariate logistic analyses of phrasing in treatment recommendations, increased physician age was associated with a decrease in the use of the use of the words "risk" or "chance" ($p<0.0605$). Recommendation of treatment to improve survival ($p<0.0112$) and increases in the number of times physicians would speak with patients before recommending treatment ($p<0.0919$) were associated with increased use of the words "risk" or "chance". Practice type and the recommendation of aggressive treatment across cases were unrelated to the use of the words "risk" or "chance" (see Appendix Table 6).

Physicians practicing in an environment with both general oncology and stem-cell transplant were more likely to express their treatment preference directly in their treatment recommendation ($p<0.0289$). No other physician characteristics or practice characteristics were related to the expression of preference for treatment (see Appendix Table 7).

Physicians over the age of 45 were less likely to refer specifically to cancer, tumor or node in their treatment recommendations ($p<0.0034$), as were physicians who recommended aggressive treatment across the three case scenarios (0.0616). Practice type, recommendation to improve survival, and the number of times a physician would speak with the patient before recommending treatment were unrelated to the reference to the cancer, tumor or node (see Table 8).

## CONCLUSIONS

With greater than 90% agreement in each of 123 coding categories, we have demonstrated that the information framing instrument provides reliable and consistent results across two coders. Additionally, we demonstrated the performance of the instrument in detecting information framing in the phrasing of treatment recommendations in response to metastatic breast cancer case scenarios.

The results of our preliminary analysis indicate that physician characteristics, practice characteristics and the goals of treatment influence how that treatment recommendation information is presented or framed to patients with metastatic breast cancer. These preliminary results may help explain why some patients receive risky, uncomfortable treatment with uncertain benefits.

In year 2, we plan to complete the analysis of the survey pilot data and prepare a manuscript for publication. In the final analysis of our pilot data, we will evaluate more specific hypotheses related to the correspondence of negative frames to recommendation of aggressive treatment and to patient characteristics such as age and co-morbidities. From these results, we plan to finalize the simulated patient case development and further develop the simulated patient scripts. Results of this simulated patient protocol will be disseminated through presentation, publication and the development of a final report. This method, once developed, will lead to a significant advance in our understanding of the influence of information framing in patient decision making, and help breast cancer patients and their families maximize their treatment decisions for the management of breast cancer.

REFERENCES

1.      Clark DB, Ram MD, MacDonald JS, Rees ED, Engelberg J, Noble RC.  How physician's deal with their own impending death.  Southern Medical Journal.  1990; 83:441-447.

2.      Slevin ML, Stubbs L, Plant HJ et al.  Attitudes to chemotherapy:  Comparing views of patients with cancer with those of doctors, nurses and general public.  Br Med J.  1990; 300:1468-60.

3.      Strull WM, Lo B, Charles G.  Do patients want to participate in decision making?  JAMA.  1984; 252:2990-94.

4.      Mackillop WJ, Stewart WE, Ginsburg AD, Stewart SS.  Cancer patients' perceptions of their disease and their treatment.  British J Cancer.  1988; 58:355-8.

5.      Siminoff LA, Fetting JH, Abeloff MD.  Doctor-patient communication about breast cancer adjuvant therapy.  J Clin Oncol.  1989; 7:1192-1200.

6.      Fetting JH, Siminoff LA, Piantadosi et al.  Effect of patients' expectations of benefit with standard breast cancer adjuvant chemotherapy on participation in a randomized clinical trial:  A clinical vignette study.  J Clin Oncol.  1990; 8:1476-1482.

7.      Kahneman D, Tversky A.  The framing of decisions and psychology of choice.  Science.  1981; 211:453-8.

8.      Kahneman D, Tversky A.  Prospect theory:  An analysis of decision under risk.  Economnetrica.  1979; 47:263-291.

9.      Eraker SA, and Sox HC.  Assessment of patients' preference for therapeutic outcomes.  Medical Decision Making.  1982; 1:29-39.

10.     McNeil BJ, Pauker SG, Sox HC, Tversky A.  On the elicitation of preferences for alternative therapies.  NEJM.  1982; 9: 1192-1200.

11.     Siminoff LA, Fetting JH.  Effects of outcome framing on treatment decisions in the real world:  Impact of framing on adjuvant breast cancer decisions.  Medical Decision Making.  1989; 9:262-271.

12.     Hughes KK.  Decision making by patients with breast cancer:  The role of information in treatment selection.  Oncology Nursing Forum.  1993; 20:623-628.

13.     Deber RB, Thompson GG.  Who still prefers aggressive surgery for breast cancer?  Implications for the clinical applications of clinical trials.  Arch Intern Med.  1987; 147:1543-1547.

14.     GIVIO.  Survey of treatment of primary breast cancer in Italy.  Br J Cancer.  1988; 57:630-634.

15.     Liberati A, Patterson WB, Biener L, McNeil BJ.  Determinants of physicians' preferences for alternative treatments in women with early breast cancer.  Tumori.  1987; 73:601-609.

16.    Liberati A, Apolone G, Nicolucci A et al.  The role of attitudes, beliefs, and personal characteristics of Italian physicians in the surgical treatment of early breast cancer. Am J Pub Health.  1990; 81:38-42.

17.    Weber RP.  Basic Content Analysis.  Sage University Paper Series on Quantitative Applications in the Social Sciences, 07-049.  Newbury Park, CA:  Sage, 1990.

APPENDIX

Table 1.  Information Framing Worksheet

| Survey number _____ Case number _____ | General Discussion | | | Option Recommend [ ] | | | Option Recommend [ ] | | | Option Recommend [ ] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | + | - | = | Pro | Con | Neutral | Pro | Con | Neutral | Pro | Con | Neutral |
| type of previous therapy | | | | | | | | | | | | |
| future therapy | | | | | | | | | | | | |
| cancer/tumor growth(p-slow growing, c-spread quickly, metastatic, agressive) | | | | | | | | | | | | |
| cancer/tumor/nodes/disease | | | | | | | | | | | | |
| response to therapy | | | | | | | | | | | | |
| side effects of treatment/toxicity (related to treatment--asymptomatic) | | | | | | | | | | | | |
| survival,long-term cure, prognosis (5-yr survival) | | | | | | | | | | | | |
| other aspects of life (p-family etc) | | | | | | | | | | | | |
| future (benefits-increase in knowlege, other patients) | | | | | | | | | | | | |
| quality of life | | | | | | | | | | | | |
| p-remission (length of life), c-recurrence | | | | | | | | | | | | |
| evidence/experience/data (reference) | | | | | | | | | | | | |
| general uncertainty (think, believe, try to, don't know, maybe, unclear, hopefully, think, generally) | | | | | | | | | | | | |
| physician preference (I, my opinion) | | | | | | | | | | | | |
| risk/chance/likelihood | | | | | | | | | | | | |
| general effect of treatment (well, bad) | | | | | | | | | | | | |
| other symptoms of disease (p-isolation of problems to, c-discomfort) | | | | | | | | | | | | |
| option level explilness or reccommendation (-3,0,+3) | | | | | | | | | | | | |
| number of words | (total) | | | | | | | | | | | |

†-necessary to save your life

| Table 2. Percent Agreement Between Coders by Content and Context of Phrases used in Treatment Recommendation | | | |
|---|---|---|---|
| Content Category | Case 1 | Case 2 | Case 3 |
| Previous therapy | | | |
| positive | 99.5 | 97.3 | 97.7 |
| negative | 99.5 | 97.3 | 96.8 |
| neutral | 100.0 | 97.7 | 99.5 |
| Future benefits or future therapy | | | |
| positive | 99.5 | 99.1 | 98.2 |
| negative | 100.0 | 100.0 | 100.0 |
| neutral | 99.5 | 95.9 | 97.3 |
| Cancer growth/metasteses | | | |
| positive | 100.0 | 97.3 | 98.2 |
| negative | 98.2 | 91.8 | 95.4 |
| neutral | 100.0 | 100.0 | 100.0 |
| Cancer/Node/Disease | | | |
| positive | * | * | * |
| negative | 93.6 | 92.2 | 93.2 |
| neutral | 90.9 | 91.3 | 96.4 |
| Response to Therapy | | | |
| positive | 98.6 | 98.2 | 96.4 |
| negative | 99.5 | 99.1 | 97.7 |
| neutral | 99.5 | 98.6 | 99.1 |
| Side effects of treatment | | | |
| positive | 97.3 | 97.7 | 99.1 |
| negative | 99.1 | 98.6 | 99.5 |
| neutral | 97.7 | 99.1 | 99.1 |
| Survival or long-term cure | | | |
| positive | 95.9 | 94.5 | 97.3 |
| negative | 95.4 | 96.8 | 95.9 |
| neutral | 97.7 | 98.2 | 99.1 |
| Quality of life | | | |
| positive | 98.2 | 97.3 | 98.2 |
| negative | 100.0 | 98.2 | 100.0 |
| neutral | 97.7 | 98.2 | 98.6 |
| Remission/Recurrence | | | |
| positive | 95.9 | 95.4 | 96.4 |
| negative | 97.7 | 95.0 | 97.3 |
| neutral | 100.0 | 99.1 | 99.5 |
| Physician experience or results of clinical trials | | | |
| positive | 95.0 | 96.8 | 99.5 |
| negative | 96.8 | 99.5 | 99.1 |
| neutral | 91.3 | 97.7 | 99.1 |
| Physician preference for treatment | | | |
| positive | 97.3 | 96.8 | 95.9 |
| negative | 99.1 | 98.6 | 97.3 |
| neutral | 98.6 | 98.6 | 99.1 |
| Risk or Chance | | | |
| positive | 95.9 | 98.6 | 99.1 |
| negative | 96.8 | 96.4 | 97.3 |
| neutral | 100.0 | 99.5 | 99.1 |
| General uncertainty | | | |
| positive | 88.1 | 91.8 | 96.4 |
| negative | 95.0 | 92.7 | 95.0 |
| neutral | 98.2 | 95.9 | 97.7 |

| General effect of treatment | | | |
|---|---|---|---|
| positive | 95.9 | 95.9 | 95.4 |
| negative | 98.6 | 97.7 | 95.4 |
| neutral | 100.0 | 100.0 | 100.0 |

| Table 3.   Demographic Characteristics and Practice Characteristics of Survey Respondents and Non-Respondents | | |
|---|---|---|
| | Respondents (n=87) | Non-Respondents (n=50) |
| **Average Age** | 45.5            (5.99) | 45.2            (5.41) |
| **Race** White Hispanic Asian Other | 92.9% 4.7 1.2 1.2 | 86.0% 8.0 2.0 2.0 |
| **Gender** Male Female | 92.9% 7.1 | 86.0% 12.0 |
| **Years since graduation from medical school** 6-10 11-15 16-20 21-25 >25 | 8.6% 19.8 37.0 18.5 16.0 | * |
| **New stem-cell (bone marrow) transplant patients per year** 1-5 6-10 11-20 21-30 greater than 30 | 41.2% 25.9 20.0 5.9 7.1 | 80.0% 10.0 2.0 2.0 0.0 |
| **Practice type** general oncology stem-cell transplant only mixed (general oncology and    stem cell transplant) | 46.4% 0.0 53.6 | * |
| **Average number of times see typical patient prior to recommending treatment** | 2.34            (1.2) | * |

| Table 4.   Case Scenario Recommendations | | | |
|---|---|---|---|
| | Case 1 | Case 2 | Case 3 |
| Treatment Recommendation | | | |
|   Stem Cell Transplant | 97.4% | 50.7% | 30.4% |
|    Intermediate Dose Chemotherapy | 0.0 | 11.3 | 10.1 |
|    Standard Dose Chemotherapy | 2.6 | 38.0 | 59.4 |
| Reason for Treatment Recommendation | | | |
|   Survival | 95.0% | 67.1% | 33.8% |
|   Quality of Life | 17.5 | 64.4 | 87.3 |

**Table 5. Univariate Log-Linear Analysis of the Number of Recommendations of Stem Cell Transplantation (Aggressive Treatment) Across Three Patient Scenarios**

| Parameter | Estimate | p-value |
|---|---|---|
| Age | -0.0143 | 0.3036 |
| Male Gender | -0.0647 | 0.8233 |
| White Race | 0.0812 | 0.7793 |
| Number of Times Physician would Speak with Patient before Making a Treatment Recommendation | -0.0686 | 0.3496 |
| Number of New Stem Cell/Bone Marrow Transplant Patients a Year | 0.0048 | 0.9596 |
| Reason for Treatment Recommendation: Survival Quality of Life | 0.3998 -0.3214 | 0.0003* 0.0484* |

| Table 6. Multivariate Logistic Analysis of the Mention of "Risk" or "Chance" in Treatment Recommendation | | |
|---|---|---|
| Parameter | Estimate | p-value |
| Physician characteristics | | |
| Age | -0.5592 | 0.0605† |
| Practice Type | 0.1988 | 0.4911 |
| Practice characteristics | | |
| Recommendation of Aggressive Treatment | -0.1708 | 0.4233 |
| Treatment Recommendation to Improve Survival | 0.5944 | 0.0112* |
| Number of Times Physician Would Speak with Patient Before Recommending Treatment | 0.2057 | 0.0919† |

| Table 7.  Multivariate Logistic Analysis of the Expression of Physician Preference for Treatment in Treatment Recommendation | | |
|---|---|---|
| **Parameter** | **Estimate** | **p-value** |
| <u>Physician characteristics</u> | | |
| Age | 0.2378 | 0.4691 |
| Practice Type | 0.7187 | 0.0289* |
| | | |
| <u>Practice characteristics</u> | | |
| Recommendation of Aggressive Treatment | -0.0379 | 0.8758 |
| Treatment Recommendation to Improve Survival | -0.2563 | 0.3183 |
| Number of Times Physician Would Speak with Patient Before Recommending Treatment | -0.1365 | 0.3322 |

| Table 8. Multivariate Logistic Analysis of the Mention of Survival in the Treatment Recommendation | | |
|---|---|---|
| Parameter | Estimate | p-value |
| Physician characteristics | | |
| Age | 0.2014 | 0.5211 |
| Practice Type | 0.3866 | 0.2149 |
| Practice characteristics | | |
| Recommendation of Aggressive Treatment | -0.0845 | 0.7180 |
| Treatment Recommendation to Improve Survival | 0.1737 | 0.4985 |
| Number of Times Physician Would Speak with Patient Before Recommending Treatment | 0.4244 | 0.0060* |